MISSOURI DEPARTMENT OF NATURAL RESOURCES

Fluorescent Lamps

(Mercury-containing lamps including fluorescent, neon, high-pressure sodium, high-intensity discharge, mercury vapor, and metal halide lamps)

Technical Bulletin

1/2002

Hazardous Waste Program

Fluorescent lamps may contain toxic metals such as mercury, cadmium and lead. Unbroken lamps pose a minimal threat to human health and the environment. However, fluorescent lamps contain mercury vapor under pressure and when broken, people may be exposed to toxic levels of mercury vapor and other metals which can be easily inhaled.

The Missouri Department of Natural Resources encourages prudent lamp recycling to safeguard human health and to limit the amounts of toxic heavy metals entering the environment.

Note: Please recycle any previous bulletins on fluorescent lamp management for businesses in Missouri. With the publication of the Universal Waste Rule (UWR) in Missouri, the guidance in the previous bulletin for businesses is null and void.

What are fluorescent lamps?

There are various sizes and types of fluorescent lamps. Typically four and eight-foot long lamps are used in homes, offices, and institutions. High-intensity discharge (HID) lamps such as mercury vapor, metal halide, neon and high pressure sodium lamps are commonly used by farms, businesses and cities.

Fluorescent lamps are long-lasting and energy efficient when compared to standard light bulbs. Future use is expected to increase. Some manufacturers are now producing more energy efficient lamps with less mercury.

Management Guidance

Small Number of Lamps Generated

If your business is a conditionally exempt small quantity generator of hazardous waste and it generates one or two lamps on an infrequent basis (or if you are a household or farmer), you may dispose of these in a Missouri sanitary landfill. Missouri Hazardous Waste Law does not allow anything other than very small amounts of hazardous waste (such as mercury) to be disposed in Missouri sanitary landfills. Before disposal, place the lamp into the box the replacement lamp came in, put the box into a plastic bag and secure the bag at the top before placing it into the dumpster. These precautions will reduce the risk of immediate breakage and will help protect you and the trash hauler. To better protect the environment, the department encourages you to send your lamps to a certified recycler (or if you are a household or farmer to a local household hazardous waste collection program, if available in your area).

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Recycled Paper

Note: Households and farmers that generate waste lamps have the option of handling the lamps as universal waste by complying with the UWR. A trash hauler or landfill operator has the right to refuse any waste for disposal.

Hazardous vs. Non-Hazardous Lamps

There are two methods you may use to determine whether or not the lamps are hazardous.

1. Test the waste. The test method for determining the toxicity of fluorescent lamps is the Toxicity Characteristic Leaching Procedure (TCLP). There are many reputable environmental laboratories that are capable of doing this test. Regulatory levels are published in the *40 Code of Federal Regulations 261.24* as follows:
   Mercury - 0.2 milligrams per liter (mg/l)
   Cadmium - 1 mg/l
   Lead - 5 mg/l

   If your laboratory analyses shows that TCLP levels for each constituent noted above are below the noted values, your waste is not hazardous. Your waste is hazardous if levels are equal to or greater than the levels stated for any one of the particular constituents noted above.

2. Apply knowledge of the hazardous characteristic. Most lamps that are old enough to be waste are likely hazardous. Some manufacturers now produce low-mercury fluorescent lamps. These lamps may not exceed the regulatory levels for the constituents noted above. Even some fluorescent lamps that are not low-mercury may not be hazardous. Lamp vendors may be able to provide data that show the toxic metal levels for the lamps you use. If the toxic metal levels are unknown, then the lamp is assumed to be hazardous.

Non-Hazardous Lamps

If you know your lamps are non-hazardous, you may send them to a lamp recycler or to a Missouri sanitary landfill. You should contact the landfill operator for permission before disposal. The landfill operator may refuse any waste. The landfill may require a special waste disposal request or test results before accepting the material. Even though non-hazardous lamps will pass TCLP and are not hazardous waste or universal waste, they still contain small amounts of mercury. Therefore, in an effort to reduce the amount of mercury released to the environment, you may choose to recycle your non-hazardous fluorescent lamps.

Hazardous Lamps

You may manage your unbroken hazardous lamps as either universal waste or as hazardous waste. Recycling at a Missouri facility that is certified for recovering mercury from such lamps is an option in either case. Any broken hazardous lamps must be managed as hazardous waste. Lamps should always be packed and stored in a manner to minimize breakage.

The total amount of hazardous or universal waste generated will determine how the generator is classified and what regulations apply. If you decide to manage your wastes as hazardous waste, you should obtain copies of the Missouri Hazardous Waste Management Law and regulations and the Code of Federal Regulations Title 40 Parts 260 through 280. More information about obtaining these regulations is provided at the end of this bulletin.

Lamps Sent for Recycling

Recycling is the preferred method of management for fluorescent lamps. Businesses in Missouri may send their unbroken lamps to a recycler in Missouri that has a valid resource recov-

ery certification and an approval or permit from the department for lamp storage prior to recycling. Recyclers outside of Missouri may also be used as long as they have valid permits, certifications or other authorization from the state to receive hazardous lamps. Also, unbroken lamps may be sent to another universal waste handler that will send them to a recycler. If unbroken lamps are sent as universal waste to a Missouri-certified resource recovery facility or to a universal waste destination facility in Missouri, you do not need to use a licensed hazardous waste transporter or hazardous waste manifests while in Missouri. For universal waste shipments, only universal waste transporters (common carriers) and shipping papers meeting U.S. Department of Transportation regulations are required. Large quantity handlers of universal waste (i.e., those who accumulate a total of 11,000 pounds of all types of universal wastes) need to track their shipments of unbroken lamps.

If you intend to send hazardous lamps to an out-of-state destination facility as universal waste, you should contact the environmental agencies in the states the lamps will travel through. Other states may require use of licensed hazardous waste transporters and hazardous waste manifests for shipments to a recycler, even though Missouri does not.

The Universal Waste Option

The UWR became effective in Missouri on Jan. 31, 1999. It provides a less-stringent option to hazardous waste generators for the management of certain widely generated wastes (i.e., mercury-containing lamps, thermometers, manometers, switches, thermostats, hazardous batteries and pesticides). Unbroken fluorescent bulbs may be managed as universal waste. Universal waste generators are called "handlers." The regulations are designed to allow handlers to safely collect cost-effective quantities of hazardous waste for eventual recycling or disposal. Under the UWR, fluorescent lamps may be sent to another universal waste handler, to an authorized universal waste destination facility, or to a Missouri Certified Resource Recovery Facility. For purposes of determining what regulations apply, figure the total accumulated amount of all types of hazardous wastes that you are managing as universal waste. In Missouri, this may include any or all of the wastes noted in the second sentence of this paragraph. A small quantity handler of universal waste accumulates less than 11,000 pounds (5,000 kg) of universal waste at any time. A large quantity handler of universal waste accumulates 11,000 pounds (5,000 kg) or more of universal waste at any time. If you accumulate 11,000 pounds at any time in a calendar year, you will retain your large quantity handler status until the end of the calendar year. The regulations are somewhat more stringent for large quantity handlers than small quantity handlers. For purposes of figuring your accumulation rate for fluorescent bulbs, please note that 17,500 of the standard four-foot lamps weigh 11,000 pounds (5,000 kilograms). If you wish to manage your fluorescent lamps as universal waste, you will want to obtain the department's Universal Waste Fact Sheet and also become familiar with the universal waste regulations published in 10 CSR 25-16.273 and 40 CFR Part 273 incorporated by reference.

In general, the following practices should be observed:

- Label containers with the words "Universal Waste-Mercury-Containing Lamp(s)", "Waste Mercury-Containing Lamp(s)", or "Used Mercury-Containing Lamp(s)";
- Do not store waste for more than one year unless you can show that the storage will facilitate proper recovery or disposal;
- Train employees on proper handling and emergency procedures;
- Manage broken lamps as hazardous waste;
- Large quantity handlers of universal waste must register with the department (small quantity handlers do not need to register);
- Large quantity handlers of universal waste must store the lamps so that they are not easily broken;

- Large quantity handlers of universal waste have some recordkeeping requirements (shipping papers rather than hazardous waste manifests are used);
- Shipments are made according to U.S. Department of Transportation requirements.

Hazardous Waste

Fluorescent bulbs may be disposed of as hazardous waste. Broken fluorescent bulbs must be handled as hazardous waste. The total amount of hazardous waste streams you generate or accumulate in one month or at any one time will determine which hazardous waste regulations you must meet. For purposes of calculating your hazardous waste generation rate for fluorescent lamps, the department estimates 350 of the standard four-foot long lamps weigh about 220 pounds (100 kilograms). If you generate or accumulate at any one time:

- 220 pounds or less of non-acute hazardous waste and less than 2.2 pounds of acutely hazardous waste per month, you would be considered a conditionally exempt small quantity generator;
- between 220 pounds and 2,200 pounds of non-acute hazardous waste and less than 2.2 pounds of acutely hazardous waste per month, you would be considered a small quantity generator;
- 2,200 pounds or more of non-acute hazardous waste or 2.2 pounds or more of acutely hazardous waste per month, you would be considered a large quantity generator.

Please see the department's fact sheet "Does Your Business Generate Hazardous Waste" for more information.

General Information

- Do not deliberately break fluorescent lamps.
- Do not use small commercially available drum-type fluorescent lamp crushers. Use of these devices is illegal treatment of hazardous waste.
- Check with handlers, transporters, recyclers and disposal firms on recycling or disposal costs and options that may exist in your area to help you decide on the most safe and cost effective method of managing your waste. (Names of recycling firms and lists of disposal facilities in Missouri are available from the department's Environmental Assistance Office.)

How May I Obtain Copies of Hazardous Waste Laws and Regulations?

Copies of the Revised Statutes of Missouri are available through the Revisor of Statutes at (573) 526-1288, or are available online at http://www.moga.state.mo.us. Copies of the Missouri Code of State Regulations are available through the Missouri Secretary of State at (573) 751-4015, or are available online at http://www.mosl.sos.state.mo.us. Federal regulations may be viewed at federal depository libraries or may be purchased from a U.S. Government Bookstore, the U.S. Government Printing Office, or from a commercial information service such as the Bureau of National Affairs. Federal Regulations are also available online at http://www.access.gpo.gov/nara/cfr/index.html.

For More Information

For more information on Fluorescent Lamps, please contact:

Missouri Department of Natural Resources

Environmental Assistance Office
P.O. Box 176, Jefferson City, MO 65102-0176
1-800-361-4827 or (573) 526-6627
www.dnr.state.mo.us/deq/tap
Program Home Page

Hazardous Waste Program
P.O. Box 176, Jefferson City, MO 65102-0176
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www.dnr.state.mo.us/deq/hwp
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